

Market structure dynamics and economic growth

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11. Market Structure Dynamics and Economic Growth

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1. INTRODUCTION

Giant corporations were seen as the sole and most powerful engine of economic and technological progress in the early post-war period. Schumpeter (1950) provides an image of large corporations gaining the competitive advantage over small and new enterprises and of giant corporations ultimately dominating the entire economic landscape. This advantage would be due to scale economies in the production of new economic and technological knowledge. These scale economies would result from the organisation of teams of highly trained specialists working on technological progress in a routinised fashion. The large corporation was thought to have both superior production efficiency and superior innovative efficacy. Galbraith (1956) points out that in his world of countervailing power, large corporations are superior to small ones in nearly every aspect of economic behaviour such as productivity, technological advance, compensation and job security. In his world all major societal institutions contributed to the maintenance of the stability and predictability needed for mass production. In the worlds of Schumpeter and Galbraith, there is no room for small-scale, experimenting firms thriving on the uncertainty of technological advance, whimsical markets and the individual energy of an obstinate entrepreneur. Only large industrial units were thought to be able to compete on global markets producing global products.

The continuous decline in the number of small firms in the Western economies and the alleged successes of the East European centrally led economies and the successes of the American corporate giants like IBM, US Steel and General Motors contributed to this image. In this era of mass production, the US dominated world trade in industries where it could reap

the fruits of its enormous endowments of physical capital. The efficacy of large firms was the main incentive of policy-makers when they tried to set up new regional economic entities like the European Union. Economic policy-making was aimed at maintaining stable domestic markets accommodating the mass-production technologies of these large units. Concern was growing whether the smaller European corporations in their fragmented markets could cope with their American competitors (Servan-Schreiber, 1969). The field of industrial economics was preoccupied by the virtues and the evils of large firms. See White (1982) and Lucas (1967) for two early exceptions dealing with the determinants of the share of smallness and the co-existence of large and small firms, respectively.

Also more recently, this world of ever-growing largeness and declining smallness has intrigued economists. The exploitation of economies of scale and scope was thought to be at the heart of modern economies (Teece, 1993). Chandler (1990) stresses the importance of investment in production, distribution and management needed to exploit economies of scale and scope. Audretsch stresses the influence the image of the East European economies and the perceived Soviet threat had on Western policy-makers: 'The fear in the West was not only that the accumulation of economic assets would lead to unprecedented productivity in the Soviet Union and Eastern Europe; of even greater concern was the assumed leaps and bounds in technological progress that would emerge from the huge and concentrated research and development programs being assembled. From the vantage point of the late 1950s and the early 1960s, the West seemed not only on the verge of losing the space race, but perhaps even more important, the economic growth race' (Audretsch, 1995, p. 2). It was a period of relatively well defined technological trajectories, of a stable demand and of seemingly clear advantages of diversification. Audretsch and Thurik (1997) characterise this period as one where stability, continuity and homogeneity were the cornerstones and label it the managed economy. Small businesses were considered to be a vanishing breed.

Times have changed for the centrally led economies that proved to be a failure and disappeared. They have changed also for the Western economies where large firms have been downsizing and restructuring and where entrepreneurship has been rediscovered (Carree, 1997 and Wennekers and Thurik, 1999). Birch was the first to supplement or even oppose the conventional wisdom of the late 1970s displaying evidence that most new jobs were emanating from small firms (Birch, 1981). Scanning the literature Gold (1981) finds little support for scale. Also casual evidence was starting to become available that small firms were outperforming some of their larger

counterparts. Acs (1984) shows that small-firm employment is expanding in the American steel industry at the cost of that of large, incumbent companies facing divestiture and laying off people. Already in 1984, Acs surmises that microeconomic forces such as choice of technology and organisation are at the heart of the ongoing transformation of markets and not macroeconomic disequilibria.

Slowly, more and more substantial evidence became available that economic activity moved away from large firms to small, predominantly young firms in the 1970s and 1980s. Brock and Evans (1986) provide an extensive documentation of the changing role of small business in the US economy. They are the first to attempt to understand these new developments filling the void of economic research concerning formation, dissolution and growth of businesses and concerning the differential impact of regulations across business-size classes. The new role of small firms and their new interaction with large ones is described in Nooteboom (1987b). Blau (1987) shows that the proportion of self-employed in the US labour force starts to rise in the late 1970s. Acs and Audretsch (1993) and Carlsson (1992) provide a survey of evidence concerning manufacturing industries in countries in varying stages of economic development. Acs (1996) shows that the self-employment rate in OECD countries declined until 1977 and increased between then and 1987. See also Loveman and Sengenberger (1991) and Carree et al. (1999). Carlsson (1989) provides data on the share of the Fortune 500 industrial companies in total manufacturing. He shows that this share in total manufacturing employment dropped from 79 per cent in 1975 to 73 per cent in 1985. In the same period the share of these firms in total manufacturing shipments dropped from 83 per cent to 78 per cent. More recently, he shows that the former share dropped to 58 per cent in 1996 and the latter to 75 per cent (Carlsson, 1999).

Considerable data material is available showing that the size class structure of American firms is changing. European data documenting the size distribution of firms was not available until recently in a systematic manner. However, Eurostat has begun to publish yearly summaries of the firm size distribution of EU members at the two-digit level for the entire business sector. Below we will use data from the third edition of this summary, entitled *Enterprises in Europe* (Eurostat, 1994). The efforts of Eurostat are currently being supplemented by the European Network of SME Research (ENSR), a cooperation of 16 European institutes. This organisation publishes a yearly report of the structure and the developments of the small business sectors in the countries of the European Union. See the various editions of *European Observatory* which provide an account of the state of small business in Europe such as, for instance, EIM (1997).

Table 11.1 shows the development of the share of large business (firms with more than 500 employees) in total employment in some European countries, Canada, Japan and the US in the late 1980s and early 1990s. On average, European countries have experienced a decreasing share, but the most pronounced decreases are found for Canada and the US. It is striking that large-firm presence rose in Japan and Germany, two economic powers that have not performed very well recently. One has to admit, however, that the decline of smallness in these two countries has been only moderate and that the reasons for their economies to slow down differ considerably. The table does not show whether the decreases of the large firm employment share are due to sectoral shifts or whether they are due to downscaling within industries. They are probably due to a combination of downscaling in the manufacturing sector and a decreasing share of this sector in the total economy.

Table 11.1 The employment share of large firms, LFP

Country	LFP (1988)	LFP (1991)
Belgium	36	35
Denmark	23	21
Finland	39	37
France	35	34
West Germany	36	37
Portugal	24	21
United Kingdom	35	34
Canada	39	35
Japan	27	28
United States	50	43

Note: Beginning of period is 1989 for Finland and end of period is 1990 for France and West Germany and 1992 for Japan.

Source: OECD (1994).

Carlsson (1992) mentions two explanations for the shift away from a managed economy and towards an entrepreneurial economy. The *first* deals with fundamental changes occurring in the world economy from the 1970s onwards. These changes relate to the intensification of global competition, the increase in the degree of uncertainty and the growth in market fragmentation. The *second* deals with changes in the character of technological progress. He shows that flexible automation has had various

effects resulting in a shift from large to smaller firms. The pervasiveness of changes in the environment – that is in the world economy – and in the direction of technological progress results in a structural shift affecting the economies of all industrialised countries. The shift in the nature of technological change particularly involving flexible automation facilitated product differentiation and led to a new division of labour involving more cooperation and less competition between large and small firms. Piore and Sable (1984) argue that in the 1970s firms and policy-makers were unable to maintain the conditions necessary to preserve mass production. Mass production was based upon the input of special-purpose machines and of semi-skilled workers and the output of standardised products. A fundamental change in the path of technological development led to the occurrence of vast diseconomies of scale. This market instability resulted in the demise of mass production and promoted flexible specialisation. Piore and Sable (1984) use the term *Industrial Divide* for the 'reversal of the trend' from that towards more large firms to that towards more small ones. Jensen (1993) refers to the Third Industrial Revolution when describing the same phenomenon. Meredith (1987) discusses the advantages of a range of recently developed flexible production techniques for small-scaled enterprises. Audretsch and Thurik (1998) point to the role knowledge plays when explaining the shift from the managed economy to the entrepreneurial economy.

This shift away from large firms is not confined to manufacturing industries. Brock and Evans (1989) show that this trend has been economy-wide at least for the United States. They provide us with four more reasons as to why this shift has occurred: the increase of labour supply; changes in consumer tastes; relaxation of (entry) regulations and the fact that we are in a period of creative destruction. Loveman and Sengenberger (1991) stress the influence of two trends of industrial restructuring: that of decentralisation and vertical disintegration of large companies and that of the formation of new business communities. Furthermore they emphasise the role of public and private policies promoting the small business sector. See also Carree (1997) and Carree et al. (1999) for literature surveys of the determinants of the shift away from a managed economy and towards an entrepreneurial economy.

The question whether this change of the size class structure of industries has influenced the economic performance of these industries has received limited attention. This has to do with a persistent lack in knowledge of market structure dynamics (Audretsch, 1995). In other words, there is a lack in knowledge concerning questions such as who enters and exits, what determines this mobility and what are its effects, in particular on economic performance. Here we are concerned with one of the most important questions in economics: why do industries or economies grow? The link

between industrial organisation and economic growth has always been the subject of considerable debate. As exposed earlier, traditionally, the prevalent assumption was that giant companies are at the heart of the process of innovation and creation of welfare. This assumption is generally referred to as the Schumpeterian hypothesis. Recently, the debate centres on the question whether the process of decentralisation and deconcentration, which virtually every industrialised country has experienced in the last two decades, has had positive welfare implications. Audretsch (1995) calls this shift in orientation of our social-economic thinking 'the new learning'.

The question of the link between the shift in the industrial structure and subsequent growth can be answered in two ways. *First*, by investigating the many consequences of the shift in the locus of economic activity. For instance, one may study whether this shift has been favourable to the process of innovation and rejuvenation of industries. See Acs and Audretsch (1990), Audretsch (1995) and Cohen and Klepper (1992 and 1996). Alternatively, one may focus on the discussion of the relation between the role of small firms and competition and industry dynamics. See Audretsch (1993, 1995) and You (1995). Moreover, the role of small firms in the job-creation process, usually treated as a controversial topic despite countless studies showing that small firms are a major engine in this process, may be dealt with. Davis, Haltiwanger and Schuh (1996) and Carree and Klomp (1996) provide some insights in this topic. Lastly, the role of small firms as a vehicle for entrepreneurship may be the focal point of our attention. Baumol (1990) provides an extensive account of the role of entrepreneurial activities and their consequence for prosperity throughout history. Acs (1992) brings it all together in a short descriptive manner and surveys some consequences of the shift of economic activity from large to smaller businesses. His claims are that small firms play an important role in the economy serving as agents of change by their entrepreneurial activity, being the source of considerable innovative activity, stimulating industry evolution and creating an important share of the newly generated jobs. The evaluation of the various consequences of this shift is difficult but necessary to establish whether it is desirable and to be promoted by economic policy. It is difficult because none of these consequences is, in fact, independent of the other three and because the evaluation offers something of a series of trade-offs. See also Audretsch and Thurik (1997) who contrast the most fundamental elements of the newly emerging entrepreneurial economy with those of the managed economy identifying 15 trade-offs that are essential for these two polar worlds. For instance, small businesses may contribute to higher growth because of their contribution to the selection process due to their variety. On the other hand,

the selection process may lead to a lower level of stability and, hence, to welfare losses. Or, while employment levels may rise as firm size declines, the lower average wages small firms pay may at least partly offset the welfare effect induced by the employment growth.

A *second* way to answer the question is to go around the intermediary variables between the shift in the industrial structure and growth such as technological change, entrepreneurship, competitiveness and job generation. The question then becomes whether there is a direct empirical link between this shift and performance measures such as employment, growth or productivity. Some preliminary empirical results of the relation between changes in the firm size distribution and economic growth are presented in Thurik (1996). The analysis shows a positive effect of an increase in the economy-wide share of small firms on growth in gross domestic product for some European countries. The interpretation of this result is somewhat difficult because it is not clear whether changes in the economy-wide share of small firms result mainly from changes in the sectoral composition or from downscaling in the specific industries. Schmitz (1989) presents an endogenous growth model relating entrepreneurial activity and economic growth. He shows that an increase of the proportion of entrepreneurs in the working force leads to an increase in long-run economic growth. His model also implies that the equilibrium fraction of entrepreneurs is lower than the social optimal level, providing a rationale for policies stimulating entrepreneurial activity. Holmes and Schmitz (1990) develop a model of entrepreneurship in the spirit of T.W. Schultz. They show how specialisation in managerial tasks and entrepreneurship – responding to opportunities for creating new products and production processes – may affect economic development. Some evidence of a well established historical (long-term) relationship between fluctuations in entrepreneurship and the rise and fall of nations is assembled by Wennekers and Thurik (1999). In this respect also the work of Eliasson (1995) on economic growth through competitive selection is of relevance. Such a relation is characterised by significant time lags. There is more evidence on the relation between size class distributions and economic performance. For instance, see Nickell (1996), Nickell et al. (1997) and Lever and Nieuwenhuisen (1999) who present evidence that competition, as measured by an increased number of competitors, has a positive effect on the rate of total factor productivity growth. Acs et al. (1999) point to differences in competition and entrepreneurship when comparing the more successful US economy to that of Europe and Japan.

The present paper follows the second way. It investigates the link between smallness and growth bypassing the analysis of all the intermediary variables. It presents two models linking performance and firm size

distribution. As a prelude to the formal models the relative virtues of large as well as small firms are dealt with in a descriptive way.

This contribution is organised as follows. In Section 2 reasons are discussed why large firms may outperform small firms. This is followed by a discussion of reasons for the opposite phenomenon of small firms outperforming their larger counterparts. The question which effects dominate is interpreted as an empirical one. For this empirical discussion two models are used. The *first* model uses a sample of European manufacturing industries for the period 1990 through 1994. By dealing with data at a relatively low industry level the disturbing influence of changes in sectoral composition is eliminated. In Section 3 these data are described and the extent of 'smallness' in these industries is documented. Data are used of 14 manufacturing industries in 13 countries (Belgium, Denmark, Finland, France, Germany, Italy, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom). This description is followed by an analysis of the effect of the share of small firms on the growth of output in these manufacturing industries. The *second* model uses a cross-section of member countries of the European Union over a time period in the early 1990. Both data and an analysis of the effects of the growth differential between small and large firms on aggregate growth are reported upon in Section 4. Section 5 concludes with general policy recommendations. Section 2 benefited from Thurik (1996) and Carree and Thurik (1999), Section 3 from Carree and Thurik (1998) and Section 4 from Audretsch and Thurik (1997).

2. ELEVEN EFFECTS STIMULATING LARGENESS OR SMALLNESS

The debate about the causes and consequences of firm size, that is about the firm size distribution, is as old as economics itself. See Audretsch (1993). This debate received continuous academic interest but fails to have been conspicuous. Until some 15 years ago its outcome was more or less unanimous: small firms would either disappear or be allowed to lead a marginal life. There have been isolated dissidents. The early Schumpeter accentuated the role of smallness in economic restructuring and Schumacher talked about the virtues of smallness in the darkest of the mass-production times. See Schumpeter (1934) and Schumacher (1973), respectively. Santarelli and Pesciarelli (1990) elaborate on Schumpeter's ideas of entrepreneurship being the underlying force of economic development, presented in his German edition of *The Theory of Economic Development*

(1911), but partly excluded from the translated American edition of 1934. In his pioneering empirical study, Birch (1981) claimed to have discovered that most new jobs emanated from small firms. This finding contradicted the prevailing body of knowledge and intuition of that time. Mainstream economists, however, kept thinking that small firms would lead a fading life. It was not readily apparent how Birch's finding had to be reconciled with the empirical evidence showing the ongoing concentration of economic activity that had prevailed for decades. The inherent potential of scale economies was already brought forward by Adam Smith's famous pin factory example. Karl Marx advanced his image of an ever-decreasing number of giant organisations based upon a huge concentration of capital and usurping the labouring masses. Moreover, there are some theoretically powerful and empirically often corroborated mechanisms supporting the shift away from new and small firms and towards large and incumbent ones. See Thurik (1997) and Carree and Thurik (1999).

First, there is the effect of *scale*, usually interpreted as the fall of average costs with increasing volume of output. This mechanism occurs in many business functions from productive to administrative and on different levels of aggregation: in business units, in establishments and in enterprises. The sources of scale economies are well known. One is that fixed set-up or threshold costs do not vary with the level of output. For instance, the costs of setting up a scientific gathering are fixed to a large extent. The costs of the organisation and the preparation of the presentations and the presentations themselves become more effective if the number of attendants to the meeting increases.

Second, there is the effect of *scope*, usually observed as the fall of average costs of a product if the number of different but related products increases. See Nooteboom (1993). Its sources can range from the use of indivisible resources (the room where a scientific meeting is held can be used for various purposes), to complementarity (presentations at scientific meetings can also be used as material for prospective articles in journals) and interaction (discussion during and between the presentations).

Third, there is the effect of *experience*, defined as the decline of average costs with increasing production volume accumulated over time. The best-documented examples of unit costs falling over time as a result of past experience are those of the Liberty freighters and B-29 bombers during WW II. See Scherer and Ross (1990) and Lucas (1993).

It is clear that these three cost effects are detrimental to the survival of small firms. Small firms may try to compensate for these cost disadvantages by creating networks or other inter-firm relations (Oughton and Whittam, 1997). From Williamson's contribution to the economic sciences we know that the organisers of productive output can choose between two basic governance

structures: that of integration of input within the hierarchy of the firm and that of purchase of input on the market. See Williamson (1975). The *advantage* of the latter structure lies in the economy of scale resulting from specialisation. For example, the consultant gains from specialisation doing similar consultancy work for many firms for which it does not pay to employ a specialist for solving similar problems occurring only with intervals. The *disadvantage* lies in the occurrence of transaction costs. Three stages of a transaction define three different sources of costs. The stage of contact involves search and marketing costs: search costs for the firm to be consulted and marketing costs for the firm supplying consultancy inputs. The stage of contract involves information, negotiation and definition costs. The stage of control involves costs of monitoring, discussion, feedback, redesign, arbitration, etc. Nooteboom (1993) argues that smaller firms face higher transaction costs per unit of transaction than large ones because *first*, there are threshold costs in all three stages of the transaction. The relative contribution of these threshold costs disappears the larger the transaction becomes; *second*, small firms suffer more from the cost of acquiring and processing information. They are more sensitive to uncertainty, discontinuity, opportunism and specificity.

So, the *fourth* effect, the effect of *organisation* defined as using outside production for one's inputs instead of inside production, boils down to the occurrence of more scale effects and to the appearance of transaction effects of both which are damaging to the level of unit costs of small production kernels.

So far, these four effects provide the rationale for the success of large firms. There must be more factors to explain the existence and success of small ones.

The *fifth* effect is the *transportation* effect. Production and organisation costs discussed above are only part of the total cost structure. There is also the cost of delivering output to customers or bringing customers to the place where service is provided. See Scherer and Ross (1990). Many studies predict and report significant scale economies on the level of establishments in the retail industry. See Nooteboom (1982 and 1987a) and Frenk et al. (1991). Still there is a considerable number of small retail stores. Customers take into account their transportation costs when looking for supplies. This is why a geographic dispersion of demand goes together with a geographic dispersion of supply. And then smallness, at least at the establishment, plant, or in the retail case, store level has manifest advantages.

The *sixth* effect is that of the *market size*. Small firms are often well equipped to be successful in small markets. In many markets scale economies have no meaning because they cannot be obtained. For example, it is easy to check that all participants of some scientific gathering wear a different shirt.

Variety is a significant customer requirement. The market for a singular piece of apparel is small when compared to the entire textiles market. There is no apparent bonus for large firms in markets that are fragmented in size. Bradburd and Ross (1989) provide empirical evidence that small firms may prosper in market niches.

The *seventh* effect is that of *adjustment*. There is a trade-off between efficiency – production costs given some output level – and adjustability – the cost of adjusting a certain level of output. Large firms can often produce at lower unit costs than small firms can. But small firms can usually adjust their output level at lower costs than large firms, because they are either more labour-intensive or use different equipment. See Mills and Schumann (1985), Brock and Evans (1989) and Das, Chappell and Shughart II (1993). Small firms survive and even prosper in this world of flexible specialisation. See Fiegenbaum and Karnani (1991). It is the story of the two transportation firms: one firm using large lorries, thriving in a market with a persisting high demand for shipment, the other firm using small ones, thriving in a turbulent market with a varying demand for lorries. It is the story of many firms in the post-mass-consumption age: they produce exactly what the customer wants. They pay little attention to questions whether anyone else wants the product, whether the firm has made the product before or whether there will be follow-up demand for the product. See *The Economist* (1994). It is also the story of the firms in the so-called industrial districts, competing and cooperating at the same time. There is no apparent bonus for large firms in markets that are fragmented in time.

The *eighth* effect is that of *effectiveness*. The essence of this effect is that different goods and services have different meanings for different people. See Brock and Evans (1986). A shirt that fits the average attendant of a scientific meeting is not the same good as a shirt tailored to fit a specific individual and bought for showing off at a specific occasion. A shirt factory can make shirts of the first type cheaper than a tailor can. But one receives more effective units of shirt from a tailor. At least someone, who is sensitive to the satisfaction of knowing the uniqueness of his shirt or the gains of showing it off to others, will experience the effectiveness of a unique shirt. The rationale being that the existence of both the factory and the tailor in the shirt market can only be explained if output is measured in terms of effective units of shirts instead of just shirts. This not only explains the co-existence of clothing giants and tailors, but also that of supermarket chains and speciality stores, of the McDonald chain and three-star restaurants. Jackson (1984) shows in a utility maximisation context how an increase in wealth leads to the consumption of a larger variety of products. Acs, Audretsch and Carlsson (1990) suggest that international competition has increased exposure to foreign products; which would also

enlarge the demand for variety.

The *ninth* effect is that of *compensating factor differentials*. This effect becomes evident when answering the question why small firms in industries where scale economies play an important role or firms that have been termed in the industrial organization literature as sub-optimal scale firms, are able to exist? One answer provided by a now rather large literature linking firm size and age to survival rates is that they are not – at least, not with the same likelihood as their larger and more mature counterparts. It is exactly this literature identifying the positive relationship between firm size (and age) and the likelihood of survival that confirms the suspicion that, at least some small firms are confronted by a size-related disadvantage. Audretsch (1995) and Audretsch et al. (1999) suggest a different answer: small firms are able to compensate for any size-related disadvantage by pursuing a strategy of compensating factor differentials, where factors of production are deployed differently and compensated differently. Probably, smaller scale firms pursue a strategy of seeking product niches and therefore do not compete directly against the larger firms included in a rather broadly defined industry classified by a national statistical office. They do not compete on the market of outputs or on that of inputs. This is certainly consistent with the findings in Audretsch et al. (1999) that firms operating in an industry where the small firms have the innovative advantage rely less on reducing employee compensation. That is, innovative activity and pursuing niches is clearly a type of compensating strategy deployed by smaller competitors to offset what would otherwise be an inherent size disadvantage.

The *tenth* effect is that of *control*. Nooteboom (1987b) claims that this is one of the least documented. The discussion of what defines a small firm is probably as everlasting as the discussion of where small firms stem from. A challenging definition of a small firm is that of a firm where one person or a small group of persons is in control, or which bears the personal stamp of one person. Though imprecise, this definition at least stimulates the investigation of behavioural advantages like entrepreneurial energy, motivated and effective labour due to the mutual proximity of customers, suppliers, production floor, management and ownership, etc. Entrepreneurial and organisational energy may flourish and be well controlled and guided in a small environment. Many management gurus earn big money hammering this down. The best evidence of this entrepreneurial energy is that many entrepreneurs convince themselves to work below the minimum wage and convince their employees to work below market prices, i.e. at a price lower than what a large firm would offer for a similar job. See Evans and Leighton (1989) and Oosterbeek and Van Praag (1995). The higher levels of control, commitment, motivation, perseverance

and energy prevailing in small units easily explain this wage differential. That is why the effect of control is important. Wiggins (1995) discusses the related subject of ownership. He claims that ownership is the key advantage to explain why entrepreneurial activities are carried out in small enterprises rather than in large firms where the entrepreneur is an employee. It is straightforward that the effect of control is not futile in an environment where the effect of adjustment (and hence flexibility and manoeuvrability) plays a role. They reinforce each other in their struggle to outperform the advantages of scale.

The *eleventh* and final effect we would like to mention is that of entrepreneurial rewards. Since William Baumol's essay showed us that entrepreneurship cannot only be productive as well as unproductive, but even destructive, we should start thinking of ways to grab the essence of how societies reward entrepreneurial activities. See Baumol (1990). Baumol's basic hypothesis is that, while the supply of entrepreneurship varies across societies, its productive contribution varies even more. The reason is that the societal perspective determines to what degree entrepreneurial activities are used for productive achievements such as innovation or unproductive ventures such as rent-seeking or organised crime. Murphy, Shleifer and Vishny (1991) provide some empirical evidence showing that countries with a relatively high number of graduates from law schools, educated mainly to redistribute income, grow slower, *ceteris paribus*, than countries that have a relatively high number of graduates in technical disciplines.

Probably, there are many institutional factors influencing the size distribution of firms. Fiscal regulations may strongly affect the propensity of people to start firms. They may stimulate people to combine their main job in a large firm with forms of self-employment. Also, the influence of the trade unions and worker participation may drop if firms stay small. Technical requirements may be circumvented if firms stay small because small firms are often exempt from many legal, technical, organisational and environmental regulations to a certain degree.

Like the effects stimulating largeness, those stimulating smallness are not independent in their influence. The effects of market size and adjustment are mutually reinforcing when explaining smallness in many markets of producer goods and services. The supplier producing a specific car part in a given year is likely to produce a different but evenly specific part the next year. This supplier operates in a market that is fragmented both in size and time. The effects of market size, adjustment and effectiveness are mutually reinforcing when explaining smallness in many markets of consumer goods and services. The small firm producing a unique shirt this year is likely to produce a different unique shirt next year, particularly if the shirt has a high fashion value. This market is fragmented in size, in time and in taste.

3. LARGE FIRM PRESENCE AND MANUFACTURING PRODUCTION

This section investigates the effects of differences in the size class structure of firms on industrial performance in a sample of 14 industries in 13 countries for the period 1990-94. The share of large firms is calculated from Eurostat (1994). Not all data of industries and countries in this Eurostat report are used. Some countries are not incorporated because they provide establishment data instead of enterprise data. Furthermore, industries are not taken into consideration whose the total number of employees is below 10,000. Finally, Eurostat sometimes does not provide employment data due to reasons of confidentiality. Two measures of the share of large firms are calculated. The first is the employment share of enterprises with 100 or more employees, MFP (Medium-sized and large Firm Presence). For this variable there is a total of 144 observations. The second is the employment share of enterprises with 500 or more employees, LFP (Large Firm Presence). For this variable there are 130 observations. The correlation between the two measures MFP and LFP for the 130 observations is 0.93. Total production growth from 1990-93 and from 1990-94 is measured by the production indices of the industry in 1993 and 1994 with 1990 as the base year. The primary sources for the indices are Eurostat (1996) and OECD (1996).

Data are available for 13 countries (number of industries incorporated): Belgium (11), Denmark (10), Finland (7), France (14), Germany (13), Italy (14), the Netherlands (13), Norway (6), Portugal (12), Spain (14), Sweden (8), Switzerland (8) and the United Kingdom (14). All data refer to the year 1990 except for Italy (1989) and Switzerland (1991). The five countries where total employment in the industries incorporated is in excess of one million persons are Germany (7.6 million), United Kingdom (4.9 million), Italy (4.2 million), France (4.0 million) and Spain (2.4 million). Total employment in the 144 industries equals 27.3 million persons. Table 11.2 shows how these are distributed across the 14 two-digit level manufacturing industries. The next four columns of the table show the average medium-sized and large firm presence, MFP, and the average production indices of 1993 and 1994, respectively. The right hand column shows the average correlation between MFP and the production indices of 1993 and 1994. The non-weighted average of these correlations is -0.07. On average medium-sized and large firm presence and growth of production appear to be negatively related but the differences across industries are considerable. The correlations range between -0.55 for the Paper, publishing and printing industry (NACE 47) and +0.66 for Instrument engineering (NACE 37).

Table 11.2 Some statistics of 14 European industries

NACE	Description	OBS	EMPL	MFP	P93	P94	COR
21/22	Basic metals	8	907	0.87	91.6	99.4	-0.48
24	Non-metallic mineral Products	10	1,081	0.55	88.0	94.0	-0.18
25/26	Chemicals	12	2,047	0.82	100.5	107.7	0.41
31	Metal articles	9	2,972	0.39	89.0	93.8	-0.07
32	Mechanical engineering	11	3,146	0.58	87.5	93.1	0.02
34	Electrical engineering	10	2,949	0.74	99.1	107.4	0.09
35	Motor vehicles	8	1,885	0.89	85.9	96.5	0.10
37	Instrument engineering	7	492	0.54	92.0	95.7	0.66
41/42	Food, drink and tobacco	13	3,177	0.58	102.5	104.1	-0.11
43	Textiles	10	1,410	0.61	87.0	91.5	-0.48
45	Footwear and clothing	11	1,872	0.38	87.2	87.7	-0.49
46	Wood and wooden products	13	1,759	0.27	95.8	102.0	-0.09
47	Paper, publishing and printing	11	2,381	0.57	100.4	105.9	-0.55
48	Rubber and plastics	11	1,269	0.56	95.7	101.8	0.15
All		144	27,348	0.59	93.5	99.0	

Note: OBS stands for the number of countries for which data are available on MFP and production indices for both 1993 and 1994. EMPL stands for the total employment in the industries for the countries for which data are available (in thousands). MFP stands for average medium and large firm presence (the share of firms with more than 100 employees in total employment). P93 and P94 are the average production indices in 1993 and 1994, respectively. The production index in base year 1990 is equal to 100. COR is the average correlation between MFP and P93 and between MFP and P94.

Source: Carree and Thurik (1998).

To test for the existence of the effect of the share of (medium-sized and) large firms on growth of production, we use the following equations:

$$(1) \quad P_{ij} = a_i + b_j + c \underset{\text{and}}{MFP}_{ij} + e_{ij}$$

$$(2) \quad P_{ij} = a_i + b_j + c LFP_{ij} + e_{ij}$$

where i refers to industry and j to country. The variable P_{ij} is the production index of industry i in country j in 1993 or 1994 (1990=100). The variables a_i and b_j are industry and country dummies, respectively. The variables e_{ij} and f_{ij} are mean zero disturbances assumed to be i.i.d. It is necessary to incorporate industry dummies because a level of large firm presence

considered relatively high in one industry may be considered relatively low in another. Choosing a specific period for which to evaluate economic growth is crucial. If the period is too long then the size class structure of the industry may change considerably during the period of observation. If the period is too short then the effect of the size class structure may be overshadowed by the business cycle influence on industry output. We consider two periods, 1990-93 and 1990-94. In 1993 most European manufacturing industries experienced a period of recession. The average production index in our sample in that year was 93.5. The year 1994 disclosed a recovery for most industries and the average production index rose again to almost the same level as in 1990.

In Table 11.3, least squares estimation results are presented of equations (1) and (2) in case only industry dummies are incorporated, i.e. $b_j=0$ for all j . The results weighed with industry employment are presented as well. This implies that countries and/or industries with a large number of employees have a stronger impact on the regression results. Table 11.3 shows that the effect of MFP or LFP on growth of production is significant only in case weighted least squares results are considered. There is little difference between equations (1) and (2) in the percentage of variance explained. The interpretation of the coefficients in the table is straightforward. For example, the weighted least squares results in the first two rows of Table 11.3 imply that an increase in MFP by 0.1 leads to a decrease in output growth by 1 per cent for the 1990-93 period and 2 per cent for the 1990-94 period. That is, industries not only appear to be more affected by the recession in case medium-sized and large firms had a larger employment share, they also tend to recover more slowly from this recession.

Spain and Portugal are two countries in a stage of economic development different from the other countries. The GDP per capita in the two countries is about two-thirds of that in the other countries and the large firm presence in industries is considerably lower than in the same industries in the other countries. Probably many firms in Spanish and Portuguese manufacturing suffer from sub-optimal scale. Small firm presence may only have a positive effect on output growth in a certain stage of organisational and technological development in which scale economies have become less important. Spain and Portugal joined the European Union in a later phase than the other countries of the sample and probably have not yet reached this stage. See Carree and Thurik (1998) for some results showing that the effect of MFP and LFP on the growth of output is stronger when Spain and Portugal are left out.

Table 11.3 Estimation results with industry dummies (t-values in parentheses)

Measure	Year	Countries	Obs.	Unweighted	R ²	Weighted	R ²
MFP	1993	All	144	-6.66 (1.2)	0.35	-12.34 (3.5)	0.30
MFP	1994	All	144	-7.81 (1.1)	0.29	-21.23 (4.5)	0.19
LFP	1993	All	130	-0.18 (0.0)	0.34	-11.77 (3.1)	0.27
LFP	1994	All	130	-1.01 (0.1)	0.27	-19.08 (3.8)	0.16

Note: MFP is medium and large firm presence and LFP is large firm presence. Industry dummies are incorporated in all regressions.

Source: Carree and Thurik (1998).

In Table 11.4 least squares estimation results are presented when country dummies are incorporated. Only the results for MFP are presented because they do not differ considerably from those for LFP. The reason for incorporating country dummies is to correct for country-specific events in the 1990-93 and 1990-94 periods. One such event was the collapse of the Finnish-Russian trade relationship leading to a strong recession in the Finnish economy. The general conclusion remains that industries with a higher medium and large firm share in 1990 have shown less growth of output in the subsequent years. This conclusion is valid for manufacturing industries in more highly developed European countries.

Table 11.4 Estimation results with country and industry dummies (t-values in parentheses)

Measure	Year	Countries	Obs.	Unweighted	R ²	Weighted	R ²
MFP	1993	All	144	-5.85 (0.7)	0.43	-14.74 (2.6)	0.35
MFP	1994	All	144	-3.50 (0.3)	0.42	-18.58 (2.4)	0.30

Note: MFP is medium firm presence and LFP is large firm presence. Country and industry dummies are incorporated in all regressions.

Source: Carree and Thurik (1998).

4. SMALL FIRM PRESENCE AND AGGREGATE GROWTH

There are many consequences of the shift from a managed economy to the entrepreneurial one such as alterations in innovative activity, employment, wage rate, market dynamics and a propensity to export. Probably, there are many more consequences than the ones mentioned in the Introduction to the present contribution. For instance, a qualitative change in the demand for consultancy inputs will occur as a consequence of this shift. The basic question is whether, at the end of the day, the entrepreneurial economy leads to more economic growth than the managed one. In the previous section an attempt was made to answer the question using data material for the manufacturing industry only. In the present section we will go one step further and present some results as to what happens to economies as a whole. Clearly, as in the previous section no analysis will be made of all the effects this shift has on the economy, such as alterations in innovative activity, employment, wage rate, market dynamics, propensity to export, a qualitative change in the demand for consultancy inputs, etc. which themselves can be growth determinants. By looking at the economy as a whole, we are able to also take into consideration the shift from manufacturing towards services. Many manufacturing firms have downsized and concentrated on core business. This has led to an accelerated process of new firm formation in the producer services sector (Piergiovanni and Santarelli, 1995).

We observe different patterns in the economic growth of European countries. One part of these differences is due to countries being in different stages of the business cycle. Another part is due to specific institutional, historical, political and social circumstances. The question is whether there is a third part due to the stage of their transition from the managed form to the entrepreneurial form of their economy.

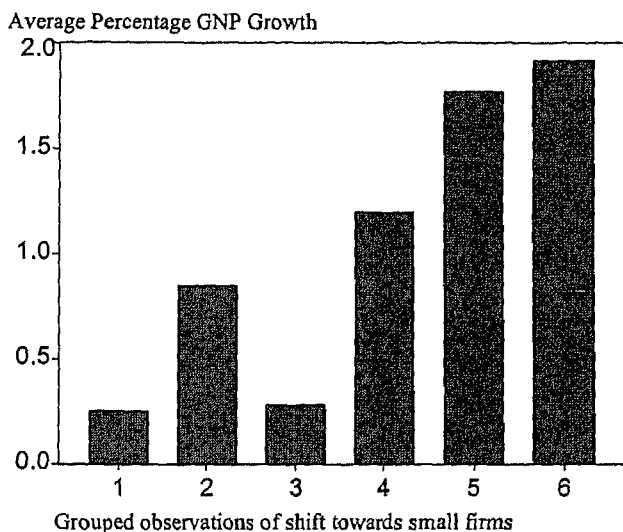
In order to test whether we are able to decompose economic growth into these three components, we have to define the entrepreneurial stage of the economy as well as growth. For growth the real gross national product is taken as indicator. The definition of the entrepreneurial stage of the economy is less straightforward. It is tempting to use the growth of the number of entrepreneurs. The number of entrepreneurs, however, is a notoriously difficult variable (Wennekers and Thurik, 1999), since the definitions throughout the European countries vary widely and attempts to synchronise lack a convincing status. Moreover, it is not available for a large enough number of European countries. See Audretsch and Thurik (1998) and Carree et al. (1999) for some recent investigations using number of entrepreneurs in

OECD countries. That is why an attempt is made to capture the stage of the transition using the annual percentage growth of value-of-shipments of small- and medium-sized firms minus the annual percentage growth of value-of-shipments of large firms.

Apart from data limitations there are other drawbacks for using entrepreneurship as a prime variable. Small firms are certainly a vehicle in which entrepreneurship thrives. There are more such vehicles such as business units within large corporations. We realise that there are more ways for entrepreneurship to contribute to growth than through smallness. Entrepreneurship, in the form of new firms, and 'intrapreneurship', in the form of new ideas and responsibilities implemented in existing organisations, are essential to creating new economic activity. Entrepreneurial energy is not limited to small business owners, self-employed individuals, etc. Large companies promote 'intrapreneurship' within business units to achieve more flexibility and innovativeness. Recent studies on the role of competition (Nickell, 1996), of deregulation (Koedijk and Kremers, 1996) of *intrapreneurship* (Stopford and Baden-Fuller 1994) and of the nature of innovation (Cohen and Klepper, 1996 and Hagedoorn, 1996) support this view. There may be something like an entrepreneurial climate affecting also large firms and governmental institutions (Wennekers and Thurik, 1999). But since what happens within these latter contexts is bound to correlate with the world of smallness, it seems justified to use the smallness indicator introduced above.

In order to link the stage of transition from the managed to entrepreneurial economy to economic growth, data are used provided by the European Observatory (EIM, 1993, Table 2.13, 1994, Table 2.18 and EIM, 1995, various tables) and by the OECD (1994). Three variables are used: the annual percentage growth of real gross national product, the annual percentage growth of value-of-shipments of small- and medium-sized firms (with employment less than 500 employees), and the annual percentage growth of value-of-shipments of large firms (with employment of at least 500 employees). They are measured for three distinct time periods: 1988-90, 1989-92 and 1990-93 for the then 12 member countries of the European Union (EU-12), i.e. excluding, Finland, and Sweden. The country-year observations are divided into six groups on the basis of the degree to which value-of-shipments has shifted from large to small firms. Group 6 has the strongest shift. For each group, the average percentage growth of GNP is computed. Figure 11.1 relates these percentage growth rates to the relative shift in economic activity from large to small firms for each of the six groups. Those groups experiencing a greater shift in economic activity towards small firms have also achieved higher growth rates.

Figure 11.1 Growth and the relative shift towards small firms



A disadvantage of using figures like the one presented here is that the causality problem cannot be solved. One cannot infer from the figure whether aggregate growth influences the excess growth of small firms or whether excess growth of small firms influences aggregate growth. An indication of the separate influences can only be given using regression relations with an adequate correction for both effects. This will be the subject of the remainder of this section. See also Audretsch and Thurik (1997).

The percentage change in gross national product of each country, ΔGNP , is linked to the stage of the transition from a managed economy to a entrepreneurial one, as represented by the percentage change in the value-of-shipments accounted for by small firms, ΔSF , minus the percentage change in the value-of-shipments accounted for by large firms, ΔLF , so that

(3)

$$\Delta GNP_{cp} = \sum_{c=1}^C \alpha_c D_c + \sum_{p=1}^P \beta_p D_p + \gamma (\Delta SF_{c,p-1} - \Delta LF_{c,p-1}) + \delta \Delta GNP_{c,p-1},$$

where D_c and D_p denote two vectors of dummy variables referring to

countries $c = 1, \dots, C$ and periods $p = 1, \dots, P$. These dummy variables are used because countries experience different stages of the business cycle at different points in time, and because country specific institutional, historical, political, and social factors are bound to influence economic growth. Clearly, one less than $C + P$ dummy variables are used while computing the regression statistics to avoid full multicollinearity. The contribution of the shift of the size class structure of firms to the percentage growth of GNP is represented by γ . The influence of this shift on GNP growth is supposed to be lagged. The data used for GNP growth refer to the 'succeeding' years 1991, 1993 and 1994.

Equation (3) also includes lagged GNP growth in order to correct for the autocorrelation of GNP growth over time. Moreover, small firms' turnover is probably more procyclical than large firms' turnover. The small firm's part of the economy has a different sectoral composition, a higher domestic orientation and a lower strategic orientation than the large firm sector. If GNP increases (decreases), lagged GNP will increase (decrease) and small firms are more (less) likely to grow than large firms. If $\delta \Delta GNP_{c,p-1}$ is left out of the regression equation, coefficient γ will become positive because of this cyclical effect. This has nothing to do with the structural effect of the size class shift influencing GNP growth we are looking for. That is why lagged GNP growth is used in the regression equation and δ can be interpreted as the 'mean' degree of autocorrelation of GNP growth in the countries of the European countries. Factors specific to each country influencing economic growth, other than the shift in economic activity between large and small firms, are reflected by α , while factors specific to each time period are reflected by β .

The data set consists of a total of 36 (12 countries times three periods) observations covering an early period. However, two outliers had to be omitted in the period 1988-90. The growth in value-of-shipsments exhibited by large firms in Spain was exceptionally high and that in Denmark exceptionally low. In *Enterprises in Europe* (Eurostat, 1994) it is reported that data for these two countries should not be used for this period. The remaining 34 observations are used for computing the regression coefficients. The only dummy variable with a significant contribution is D_{1994} . This is easy to understand in view of the unexpectedly high jump in GNP growth in 1994. Weighting with the number of active population and using dummy variable D_{1994} only, we find that γ equals 0.308 with a standard error of 0.166 and that δ equals 0.448 with a standard error of 0.167.

A limitation of the calculations is that the data include a number of estimates. Moreover, the regression results are sensitive to modification of specification. Follow-up studies are required for corroboration of these results. These studies would profit from the use of longer time series, the use of models where the reverse causality is taken into account in an explicit fashion and the use of data sets including the number of self-employed. Reverse causality can occur in various situations: growing industries may give opportunities for new and small firms using new technologies because growth may endanger the market position of incumbent firms. Furthermore, reversed causality may occur if there is a 'refugee' effect when the economy slows down. An increase in the unemployment level will probably affect the propensity of people to start firms. The latter mechanism occurs most notably in periods of downturns in the business cycle. See Audretsch and Thurik (1998) and Carree et al. (1999) for analyses using longer time series and set-ups explicitly modelling the reversed causality. See Carree et al. (1999) and Wennekers and Thurik (1999) for a more thorough treatment of the consequences of the use of various definitions of the concept of entrepreneurship. In the present study, γ representing the effect of excess smallness on aggregate growth is found to be positive. It has a t-value of 1.9 in the period 1991-94 for EU-12. We have to conclude that, based on the findings of this exercise, there is evidence suggesting that a shift in economic activity away from large firms and towards small enterprises is a catalyst for economic growth, at least for member countries of the European Union over a recent time period.

The evidence provided by Schmitz (1989) and Nickell (1996) can be considered complementary to the investigations presented here. Schmitz presents a theoretical endogenous growth model relating entrepreneurial activity and economic growth. He shows that an increase of the proportion of entrepreneurs in the working force leads to an increase in long-run economic growth. Nickell studies the effect of competition on the development of productivity of firms. He finds that an increased number of competitors is associated with higher rates of total factor productivity growth. There are several other studies that are complementary also. Audretsch and Thurik (1998) provide an analysis showing the consequence of lagging behind in the transition process. Using a sample of 23 OECD countries they find that, on average, increasing entrepreneurship leads to initially decreasing unemployment for the period 1974 through 1994. Carree et al. (1999) use the same data set but an entirely different model. They apply the concept of an equilibrium relation between the number of entrepreneurs and the stage of economic development. This relation is hypothesised to be a decreasing function of economic development in that the number of entrepreneurs per labour force

is high in low-developed economies whereas there is a later phase where mass production and scale economies thrive. A vast literature points at a still later phase of economic development where the entrepreneurship rate is increasing again. This phase is characterised by 'the reversal of the trend' (Brock and Evans, 1989, Loveman and Sengenberger, 1991, and Carree, 1997) towards decreasing economies of scale and scope. Therefore a U-shaped equilibrium relation is tested in their set-up. They present evidence that such a relation exists and that deviating from the equilibrium rate of entrepreneurship leads to lower economic growth. Out-of-equilibrium situations can occur due to exogenous shocks and institutional divergences, for instance, because government regulation of market activity might obstruct and frustrate the spontaneous, corrective forces of entrepreneurial adjustments.

5. SMALLNESS AND ECONOMIC GROWTH

Causes and consequences of the shift in economic activity from large to small firms have been on top of the research agenda since the early 1980s. In the present contribution it is investigated whether a higher share of small business at the start of the 1990s has led to higher output growth in the subsequent years in European manufacturing. Second, an analysis is made whether excess growth of small firms over their larger counterparts has led to additional macroeconomic growth for member countries of the European Union in the early 1990's. The results of both investigations are meant to supplement the intuition of many policy-makers that the changes in industrial structure have had some real effects on economic performance. Indeed, the results indicate that a manufacturing industry with a low large firm presence relative to the same industries in other countries has performed better in terms of growth of output. This suggests that lagging behind in the industrial restructuring process has come at a cost of lower economic growth. The results also indicate that on the macroeconomic level additional growth may be expected if small firms grow faster than their larger counterparts. Countries that have been most active in stimulating the small business sector in the 1980s may very well have reaped the fruits of this policy. Regression calculations such as the ones presented in the present contribution are a powerful instrument but have shortcomings. They refer to a certain period, to certain countries and depend upon the implicit assumptions of the underlying model. The results become more powerful if the findings are in line with related work in this area using other data and other methodologies. There is a growing body of related work producing similar results such as that of the endogenous growth model of

Schmitz (1989), of Nickell (1996) studying the effect of competition on the development of productivity of firms, of Audretsch and Thurik (1998) on the relation between the number of entrepreneurs per labour force and unemployment and of Carree et al. (1999) on the equilibrium relation between the number of entrepreneurs per labour force and the stage of economic development.

European politicians and representatives of social and institutional groups fear for a further rise of the already unacceptably high level of unemployment. The endless series of efficiency and cost-cutting operations of the public and large business sectors cause this high level. They hope that unemployment can be fought by stimulating smallness. Probably, this is true for various reasons. *First*, stimulating smallness lifts the dependency on possibly sluggish and transient resources like scale, scope and experience, and intensifies the dependency on resources such as adjustment and effectiveness. The latter resources are likely to be more robust against uncertainty and change than the former. Stimulating small firms means stimulating new and hence young firms. This implies stimulating newness and diversity. Both are indispensable ingredients for prosperous modern economies. Diversity is the starting phase for selecting, and selection breeds the next generation's products and markets. *Second*, stimulation of smallness means stimulation of labour-intensity and hence employment by definition. See Loveman and Sengenberger (1991). *Third*, stimulating small firms is a means of stimulating entrepreneurship, in the form of new firms and in the form of new ideas and responsibilities implemented in existing organisations. This is essential to knowledge-based economic activity because the potential value of new ideas and knowledge are inherently uncertain (Audretsch and Thurik, 1998). The existing firms will not pursue many new ideas because they have different agendas or simply do not recognise their potential value. If a new firm is not started to pursue such ideas they will simply remain untapped.

The industrial structure of a knowledge-based entrepreneurial economy is very different from one based on the mass-production of relatively known products using established processes. It is a much more fluid and turbulent economy, where people are quick to move into situations where their ideas are valued. It is an economy where failure loses much of its pejorative connotation because it is recognised that trial and error and experimentation are essential to innovation and the creation of new ideas. A knowledge-based entrepreneurial economy also promotes human fulfilment. Just as creativity, autonomy and independence become not only important characteristics for personal growth and development (Lumpkin and Dess, 1996), but also for economic growth and development, managerial and organisational structures

of hierarchy and authoritarianism give way to teamwork, networks and interdependence. *Finally*, stimulation of smallness implies an increase in the variety of the range of products and services offered. This paves the way for a process with different innovative approaches (Cohen and Klepper, 1992) and also satisfies a fragmented and differentiated demand.

We do not claim that each new and small firm is an agent of change, representing the new entrepreneurial economy. In fact, our analysis in Section 3 has shown that the effect of small business presence on economic progress depends upon the industry and stage of economic development. Many of the traditional small firms (mom-and-pop businesses) in less developed countries can be characterised rather as obstacles to change than as agents of change. Also, many of the small start-ups in highly developed countries play only a limited role as agents of change and many of them disappear after a short time period. Policies providing incentive schemes for new and small firms in general may therefore suffer from decreased probabilities of new firm survival without achieving much transformation towards an entrepreneurial economy. However, there is room for at least two types of policy intervention. The first type is policy aimed at promoting the creation of new technology-based firms in selected industries. The second type is policy aimed at providing newly created firms, irrespective of their industrial classification, with the financial, organisational and technological resources needed to grow in both domestic and foreign markets. This type of generic policy in particular promotes variation among new businesses. This creates the basis for a selection process that may result in new products and approaches. This selection process may not be hampered by incumbent firms striving to maintain their competitive position.

In the United States small firms replaced large firms not just in terms of generating the large majority of the 18 million new jobs created in the 1980s, but also in terms of much of the innovative activity that has driven the growth of new industries and renewed international competitiveness (Audretsch, 1995). Meanwhile, throughout Europe, job layoffs and downsizing of large enterprises, often in traditional moderate-technology industries, have been common phenomena.

The industrial transformation is shaping the development of Western capitalism and should trigger a shift in government policies away from constraining the freedom of business to contract through regulation, public ownership and antitrust. It should be geared towards a new set of enabling policies fostering small and new firms, entrepreneurship and the creation and commercialisation of new knowledge. What specific policy measures have to be taken is the object of a different study. De Koning and Snijders (1992) provide a survey of the various public policies introduced during the 1980s in

the countries of the European Union. See also Storey and Tether (1998) and OECD (1998). Embracing the resolutions of the 1997 Luxembourg summit on unemployment would be a wise first step. These resolutions dealt with the stimulation of new and young firms in areas such as tax deregulation, administrative measures, loan guarantee programmes, venture capital, joint venturing, enterprise culture, training programmes, access to technology and R&D and impact reports. The empirical results obtained in this paper and supported by findings in the recent literature suggest that a policy of stimulating small firms, or more generally entrepreneurship, may be one of the most effective ways of combating the current alleged weakness in competitiveness, growth potential and employment generation of European industry.

NOTES

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